Day after day, these new pioneers—frontiersmen even in the midst of the great cities—are out in search of bacteria, which are what the wild beasts or savages were to the early settlers, or the elusive element or the invisible principle or the pervasive but unformulated law. And night after night they venture forth over the universe's quadrillions of miles as hunters in the skies to bring back fresh bits of stellar truth to the earth. To rank such service with that of the old frontiersmen of the western solitudes and to let its findings take their place in the most important news of the day is one of the very encouraging signs in a democracy about which so many disparaging observations are made.

The privation of the new frontiersman is not as a rule that of living far from neighbors and friends, of enduring untempered cold or withering heat, or of going without sufficient food. It is the hardship of holding one's self to a course of study or research that will lead out beyond the edge of the known, the privation of denying one's self every comfort to find what the truth is and the suffering of following wherever the truth leads. When the public put such men among their greatest citizens, as the people of France put Pasteur, there need be less anxiety about democratic ideals. But the scientists should take the great public into their confidence. If the scientist have not the ability to speak to the people, then he should have in his city laboratory or his field tent with him an interpreter, the reporter, one who can "merge scientific facts into new human relations." The reporter must also be a frontiersman.—*The New York Times.*

SCIENTIFIC BOOKS

The Mineralogy of Pennsylvania. By SAMUEL G. GORDON. Special Publication No. 1, The Academy of Natural Sciences of Philadelphia, 1922, 255 + xiv pp., plate and text illust. 8vo.

"The Mineralogy of Pennsylvania" gives in an exceptionally clear and concise way all the essential data as to the geology and mineralogy of the state. The crystal forms are not only described but well illustrated, and for each of the many minerals one or more of the best analyses are presented. The book opens with a graphic historical outline. The first great inspiration to the science in Pennsylvania might be said to date from the pilgrimage made to the laboratory of Abbe Haüy in Paris by several Pennsylvania students, notably Adam Seybert, Gerard Troost (a native of Holland), and later by Lardner Vanuxen and William Keating, whom we may regard as the first scientific mineralogists of America. A powerful aid to the development of the study was the fine collection of minerals brought back from Europe by Adam Seybert.

The founding of the Chemical Society in Philadelphia in 1792, marks one of the earliest stages in this science and that of mineralogy in the United States. Following this came the organization of the Academy of Natural Sciences of Philadelphia, the first mineralogical accessions being some artificial crystals prepared by Dr. Troost. Later, Seybert's collection was acquired, and was lectured upon by Troost. Contemporaneously, in 1812, Isaac Lea published "An Account of the minerals at present known to exist in the vicinity of Philadelphia"; four years earlier, in 1808, Adam Seybert had issued his "Catalog of some minerals which are found in different parts of the United States." It is impossible to overestimate the inspirational value of these early writings.

"The Origin and Occurrence of Minerals" are treated on pp. 11-22. A synopsis of the classification of minerals according to their occurrence by Wherry and Gordon is given, followed by a discussion of each kind of deposit, with lists of the minerals of each assemblage. A new arrangement of the well-known classification of rocks after Rosenbusch, Kemp and Iddings is presented. Data of this chapter are not available elsewhere. General Geology of Pennsylvania: Here, on pp. 23-24, the geologic formations of the state are tabulated, with notes on the character of the rocks and their minerals. This is the most up-to-date and complete statement of the geology of the state that is available.

One hundred and fifteen pages (34-149) are devoted to a detailed description of about two hundred and fifty minerals found in the state. After the heading of each mineral, in which name, composition and crystal form are stated, the mineral is described in the following order: color, lustre, form, hardness, specific gravity,

and then crystallography, composition and localities in Pennsylvania. A large number of crystal figures illustrate this part.

The mineral localities are listed according to counties and thence according to townships (pp. 150-240). After a statement of the exact situation of a locality, based on Kemp's Coordinate System, the geology is briefly noted, followed by annotated lists of the minerals of the localities arranged usually in a genetic order, with complete references to the literature. On p. 176, Wheatly mines, there is a typical illustration of this method of arrangement. The date and place of the first publication of discovery is everywhere given.

Pennsylvania has been, strictly speaking, more a state of mineral collectors than any other in the United States. This centered about the city of Philadelphia for a period of fully sixty years and, although the men frequently were scientific mineralogists, yet they were intelligent collectors and did not confine themselves only to Philadelphia and the many localities about it, but brought together collections of the finest minerals in the world, notably the Clarence S. Bement Collection, forming the main part of the Morgan-Bement Collection of the American Museum of Natural History, the finest private collection ever gotten together.

Many of these collectors met at the home of the late W. S. Vaux on Saturday afternoons, and at the home of Clarence S. Bement on Sunday afternoons, for the exchange of ideas and to study the minerals and sometimes to exchange specimens.

Among these men were Colonel Joseph Wilcox; Dr. Joseph H. Leidy, the great biologist, who formed a fine collection of gems and several collections of minerals; George W. Fiss, who drifted into microscopic mineralogy; J. M. Cardeza, of Wilmington; Joseph Wharton, who founded the Wharton School at the University of Pennsylvania; John Hancock, whose collection was acquired by the Holden Fund for Harvard University; T. D. Rand; W. W. Jefferis, whose collection is now in the Carnegie Museum in Pittsburgh; Dr. George A. Koenig, who discovered the diamond in the Canyon Diablo meteorite; Dr. Joseph Genth, who analyzed many minerals, frequently with results that gave us original species. Thus we have the minerals, jefferisite, genthite, bememtite, footeite, randite, wilcoxite. There were a number of dealers, among the most important of whom were the late Dr. A. E. Foote and Joseph Pennypacker, of West Chester, Pa.

Wharton gave his name to the Wharton School, and W. S. Vaux[1] left his collection to the Academy of Natural Sciences in Philadelphia, and the Vaux collection was the pride of the academy's splendid display of minerals.

Had it not been for this early interest in mineralogy and the number of interesting localities in Philadelphia and the nearby region, this group of collectors would not have materialized, and mineralogic science would be without the many collections which came through them.

The magnificent pyrites and associated minerals from French Creek, the garnets and beryls from Avondale, the felspar from Media, the amethyst from Upper Providence, the great variety of zeolites from Philadelphia and its vicinity, the minerals of Delaware County, the pyro-morphite and wulfenite from Phœnixville, and the millerite from the Gap Mines, grace many of the finest collections in the world.

The great collection of Clarence S. Bement (died Saturday morning, January 27, 1923, at Philadelphia, Pa.) represented not only thirty years of assiduous collecting, but the buying of many collections—fifty or more minor collections—including the selection from the entire collection of Norman S. Spang which was the result of thirty years collecting by Norman Spang (died December 10, 1922) and his father before him. The latter visited the principal localities throughout England, Germany and Switzerland every year, whereas the son, because of his health, spent his summers in the Lake Superior region and his winters in Florida, which meant that he visited all the northern localities, North Carolina, Virginia and the eastern states generally.

This collection eventually became the property of the American Museum of Natural His-

[1] His nephew, George Vaux, inherited several dozen of the finest specimens, and has been a most assiduous collector and has financed the recent trip of Dr. Gordon to South America.

tory and really is Pennsylvania's offering to American mineralogy, as this is undoubtedly the finest collection of minerals in the United States and ranks among the two or three finest of the entire world. All the choicest specimens of the Spang collection were merged in the Bement collection by the purchaser and it is now known as the Morgan-Bement collection. Biographical notice of these two eminent collectors will appear later.

The listing of the mineral localities according to counties and then according to townships is very useful to those studying the minerals and their occurrence, and at the same time gives precise data where to look for the minerals themselves.

The bibliography of Pennsylvania's mineralogical literature is remarkably complete and there is an admirable index.

GEORGE F. KUNZ

SPECIAL ARTICLES

A POCKET DISSECTING SCOPE

THIS new dissecting device was designed for the purpose of providing a simple and efficient instrument for examining small megascopic objects such as are encountered by the general nature lovers and students in plant and insect systems. And also to provide a small compact instrument of this kind that could be easily folded and closed up and conveniently carried in the student's pocket.

Fig. I shows a simple sectional elevation of the pocket scope in working adjustment.

Fig. II gives a view of the instrument folded and closed.

The device when adjusted for work, Fig. I, is operated by holding it in the left hand, the forefinger resting upon the knurled surface (b) of the slidable and revolvable tweezer (5), and the thumb upon the tiltable focusing block (4). By a conjointed motion of the finger and thumb thus placed it is surprisingly easy, when the lens is held under the eye, to keep the object (f) in focus while it is being picked by means of a needle held in the right hand, or, revolved by the forefinger of the left hand to secure views of the object (f), from all angles.

A forward and backward movement of the thumb pressing upon the tiltable block (4), lowers and raises the lens (1). Thus focusing is made easy.

A movement of the forefinger at right angles on the knurled surface (b), revolves the tweezer in its socket (6), thus bringing to view the various portions of the object (f).

The tweezer rod (c), being slidable as well as revolvable in its socket (6), the object (f) can be easily adjusted laterally under the lens (1).

Section (7) is a hollow tube permanently closed at each end, to one of which is attached the lens and its operatives (1, 2, 3, 4, 5, 6). This section (7) is separably and invertibly insertable into section (8), (8) being an open hollow tube inwardly shouldered at each end to limit the extent of insertion of (7) and (9).

Section (9) is a tool box composed of a hollow tube closed at one end and containing tool sockets for holding dissecting instruments (10) at the other. This box is invertibly insertable into (8).

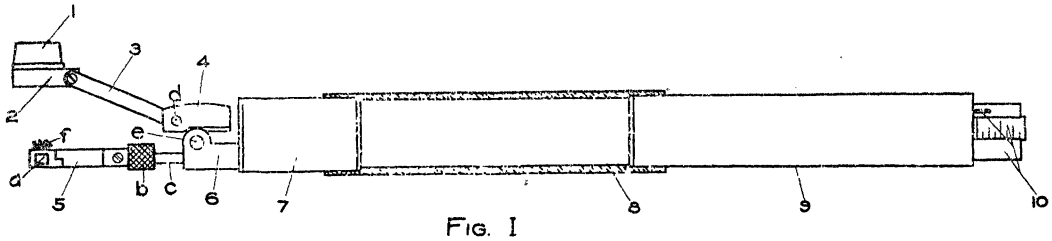

FIG. I

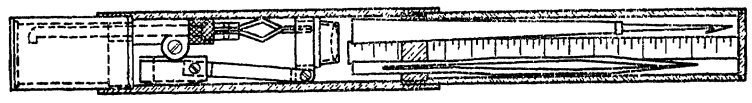

FIG. II